

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>YY8275</b>	<b>FOR FURTHER ACTION</b>	See Form PCT/IPEA/416
International application No. <b>PCT/JP2004/017791</b>	International filing date ( <i>day/month/year</i> ) <b>30.11.2004</b>	Priority date ( <i>day/month/year</i> ) <b>01.12.2003</b>
International Patent Classification (IPC) or national classification and IPC <b>B22F1/02, B01J19/00, B22F9/24</b>		
Applicant <b>KOJIMA CHEMICALS CO., LTD.</b>		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> ( <i>sent to the applicant and to the International Bureau</i> ) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> ( <i>sent to the International Bureau only</i> ) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. I

Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- nos. \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- sheets \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>1-15</u>	YES
		Claims _____	NO
	Inventive step (IS)	Claims _____	YES
		Claims <u>1-15</u>	NO
	Industrial applicability (IA)	Claims <u>1-15</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
	Document 1: JP 2002-060805 A (Chemipro Kasei Kaisha, Ltd.), 28 February 2002		
	Document 2: JP 11-241107 A (Shizuko SATO), 07 September 1999		
	Document 3: JP 2003-055703 A (The Korean Advanced Institute of Science and Technology), 26 February 2003		
	Document 4: JP 61-223110 A (Tanaka Kikinzoku Kogyo Kabushiki Kaisha), 03 October 1986		
	Document 5: JP 62-077406 A (Tanaka Kikinzoku Kogyo Kabushiki Kaisha), 09 April 1987		
	Document 6: JP 10-265812 A (Sumitomo Metal Mining Co., Ltd.), 06 October 1998		
	Document 7: JP 08-176605 A (Sumitomo Metal Mining Co., Ltd.), 09 July 1996		
	Claims 1 to 15		
	Document 1 cited in the international search report indicates that a colloidal dispersion of a multi-component composite metal was produced by mixing a plurality of metal colloid solutions that comprise different species of metal; indicates that a colloid-protecting agent was used during the production of metal		

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

colloid solutions by reducing solutions that contain metal ions (refer to the claims and the like); indicates that the phrase "colloidal dispersion of a multi-component composite metal" is a general term describing dispersions or the like wherein cores formed from particles of a first metal are coated with shells formed from a second metal (refer to paragraph [0004]); presents various substances that can be used as colloid-protecting agents (refer to paragraphs [0020] to [0025]); and indicates that by simultaneously reducing two species of noble metal that are present within a single solution, it is possible to obtain a dispersion of metal nanoclusters with a core/shell structure wherein one metal constitutes the cores while the other metal constitutes the shells (refer to paragraph [0002]).

Meanwhile, document 2 cited in the international search report discloses a method for the production of metal microparticles, which is characterized in that the non-ionic surfactant and the transition metal ions react with one another within the solution (refer to the claims and the like); makes disclosures pertaining to nanometer-sized microparticles (refer to paragraph [0002]); and indicates that composite metal microparticles with a layered structure were formed by forming microparticles of a first metal within a solution, then adding ions of a second transition metal so that the atoms of the second metal form a layer upon the surfaces of the microparticles, and thereafter sequentially adding ions of a third transition metal and ions of a fourth transition metal so that the atoms of the third transition metal and the atoms of the fourth transition metal form layers upon the surfaces of the microparticles

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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(refer to paragraph [0010]).

Document 3 cited in the international search report discloses a method for producing metal nanoparticles with a core/shell structure by dissolving nanoparticles of a first metal in an appropriate organic solvent, dissolving a metallic precursor which contains a second metal with a reduction potential higher than that of the first metal in an appropriate organic solvent and then combining the resulting solutions in order to induce a transmetalation reaction between the first and second metals (refer to the claims); indicates that the reduction potential is associated with the ionization tendency of metals, and that the ionization tendency of metals decreases in the order of  $K > Ca > Na > Mg > Al > Mn > Zn > Cr > Fe > Co > Ni > Cu > Hg > Ag > Pd > Pt > Au$ , for example, wherein the metals positioned further towards the left end have a lower reduction potential, which is to say a strong tendency to be oxidized, while the metals positioned further towards the right end have a higher reduction potential, which is to say a strong tendency to be reduced (refer to paragraph [0014]); indicates that the nanoparticles of the first metal, which can be used as cores, may have either a single metal composition or a multi-element metal composition with a core/shell structure or a mixed alloy structure; indicates that the nanoparticles of the first metal are supplied in the form of a solution, which is obtained by dispersing said nanoparticles in an appropriate organic solvent; and indicates that the metal precursor solution, which comprises the second metal that constitutes the shells, is obtained by dispersing an appropriate precursor, which contains the second metal to be transmetalated, in an

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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appropriate organic solvent (refer to paragraph [0018]).

Meanwhile, the fact that adding a protective colloid during the production of metal microparticles by means of a reduction reaction within a solution will cause the particle diameters of the metal microparticles to equalize is well known, as disclosed in documents 4 to 6 cited in the international search report.

Meanwhile, document 7 cited in the international search report discloses a palladium-coated silver powder (refer to the claims and the like); indicates that the palladium-coated silver powder can be used as a composition for forming a conductive coating film (refer to paragraph [0001]); and indicates that it is possible to adjust the particle diameters arbitrarily within a range of 0.3 to 1.0  $\mu\text{m}$  while still maintaining a sharp particle diameter distribution (refer to paragraph [0007]).

It is thought that a person skilled in the art could coat another metal upon metal nanoclusters that have a core/shell structure, as appropriate, and the fact that protective colloids impart a particle size-equalizing effect is well known.

Furthermore, configurations of the invention set forth in claim 7 wherein a palladium coating layer is formed around the periphery of the palladium layer correspond to configurations that have simply been coated with a palladium layer, and thus the resulting metal microparticles are the same as those disclosed in document 7. In addition, configurations wherein a coating layer of a metal other than palladium is formed around the periphery of the palladium layer are not significant in as much as a person skilled in the art could determine

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/017791

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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how many layers are to be included within the layered  
structure, as appropriate.